

REMARKS

Status of Claims

This application has been carefully reviewed in light of the Examiner's action dated September 2, 2010 ("Office Action"). At the time of that action, claims 40, 41, 43 – 82, 85, 86, and 90 – 93 were pending. In this response, claims 81, 82, 85, 86, 90, 91, 92, and 93 are amended. No claims are canceled, and no new claims are added. No new matter is added by these amendments.

The Office Action has rejected Claims 40, 41, 43 – 81, 85, 86, and 90 – 93 under 35 U.S.C. §103(a) as being unpatentable over the cited portions of U.S. Pat. No. 5,801,914 to Thrash ("Thrash"), in view of U.S. Patent No. 6,243,018 to Saito, et al. ("Saito"). The Office Action has further rejected Claim 82 under 35 U.S.C. §103(a) as being unpatentable over Thrash in view of Saito, and further in view of the cited portions of U.S. Pat. No. 3,801,914 to Crawford ("Crawford").

Reconsideration and full allowance are respectfully requested.

35 U.S.C. §103 Rejections

Independent claims 40, 81, 82, 85, 86, 90, 91, 92, and 93 stand rejected as being unpatentable over combinations of Thrash, Saito, and Crawford. To establish a *prima facie* case of obviousness, the cited references, combined with the knowledge of those of ordinary skill in the art, must teach or suggest all the claim limitations. Applicants respectfully traverse this rejection at least because the combination of Thrash, Saito, Crawford, and ordinary knowledge in the art fails to teach or suggest all the recitations of the independent claims as amended.

As generally recited in the claims, embodiments of an electrical supply line run between a current feed terminal and a current delivery terminal. The electrical supply line has:

- (a) a current-carrying inner conductor, surrounded by
- (b) an electrically isolated protective sheath, further surrounded by
- (c) a detector element (with successive windings), enclosed within
- (d) a protective enclosure,

- (e) where the detector element is adapted in such a way that an electrical and/or optical property is irreversibly changed when a local arc originates from the inner conductor, so as to pass through the detector element, irrespective of a direction of the arc.

This results in an isolating circuit isolating the inner conductor from a current source.

Turning first to Thrash, an electrical safety circuit is provided for discontinuing power on overheat conditions. Apparent, the Office Action characterizes Thrash as including an inner conductor (element 28) surrounded by a protective sheath (element 32), and a detector element (element 34) embedded within a protective enclosure (element 32). The heating element of Thrash is different from the claimed electrical supply line for a number of reasons.

One different is between the concentrically-layered construction of the claimed electrical supply line and that of the heating element of Thrash. As claimed, the inner conductor is surrounded by an insulating layer, which is surrounded by the detector (having successive windings), which is surrounded by the protective (e.g., outer) layer. Notably, the Office Action refers to both the protective sheath and the protective enclosure as element 32, even though those are separate elements of the independent claims. Further, nothing in Thrash seems to suggest surrounding the insulating layer with the detector, let alone surrounding using successive windings.

Another difference is that the detector of Thrash runs longitudinally, such that it runs in the same direction as, and is always oriented in the same direction from, the inner conductors. As discussed in previous responses, the detector of Thrash does not detect arcing from the inner conductor through the detector. Even where Thrash mentions arcing, the arcing is apparently mentioned only as a cause of overheating of the PTC layer. The overheating of the PTC layer is then detected by the detector (i.e., not the arcing). However, even if, *arguendo*, the detector of Thrash were capable of detecting an arc, it could only do so if the arc were to occur in one direction (i.e., precisely in the direction of the detector), as opposed to “irrespective of a direction of the parallel local arc,” as recited in the claims.

For at least these reasons, Thrash fails to teach or suggest the recitations of the independent claims.

Saito fails to remedy these deficiencies of Thrash. Saito generally discusses a wire harnesses configured for multiplexing between processing units and a battery of a vehicle. Some wire harnesses of Saito include multiple conductors each coated with an insulator, which all run

within a conductive sheath covered by an insulating sheath. The conductive sheath can be monitored to determine, for example, whether the wire harness has experienced a short circuit condition.

Notably, the detector of Saito does not appear to detect problems in the conductor, but rather in the detector itself. For example, the detector detects its own short circuit condition as an analog for detecting a short circuit condition somewhere in the wire harness. As stated in Saito's "Background of the Invention" section, the problem being addressed is that the coating of the wire harness may be damaged (e.g., by rubbing against metal parts during insulation), thereby inadvertently removing insulation from around the conductors and potentially causing shorts. Accordingly, when the outer coating of the harness is removed, the intermediate conductive layer of Saito (element 2) would short to the vehicle chassis. This would indicate a short circuit condition regardless of the condition of the inner conductors.

For the above reason, it makes no sense to construe Saito as being concerned with detecting arcing originating from the inner conductors.

Further, it would make no sense to combine the detector of Saito with the heating element of Thrash. First, surrounding the heating element with the detector may interfere with heat transfer from the PTC layer to the blanket. Second, surrounding the heating element with an additional detector layer may interfere with desired properties of the heating element as part of a blanket. As stated in Thrash:

"The two above-mentioned most preferred compositions for conductive fiber 34 are preferred because they are strong enough to withstand the normal flexing, handling, and laundering of electric blankets, and are flexible enough so as to not make the blanket too stiff." (Col. 4, ll. 46 – 50).

Indeed, adding a layer of detector element surrounding the entire heating element would likely have a negative impact on the stiffness of the blanket. Finally, there would be no need to surround the heating element with the detector. The overheating condition that is actually being detected by the detector of Thrash would occur throughout the PTC layer (even if relatively local, it would at least be substantially omnidirectional at that location). Accordingly, locating the detector in a single direction would not impact the ability of the detector to detect the overheating condition.

Finally, while Crawford was explicitly used by the Office Action only in the context of Claim 82, it is worth noting that Crawford still does not remedy the deficiencies of Thrash and

Saito. First, Crawford apparently does not suggest a detector element enclosed within a protective enclosure. Rather, the detector elements of Crawford (elements 16) are largely exposed, except where they happen to be overlapped by skid wires 19.

Second, the disclosure of Crawford suggests that its detectors are formed (e.g., using thermoplastics) so that an envelope melts away when exposed to excessive heat dissipations due to a cable fault. Accordingly, there seems to be no teaching or suggesting of detecting an arc, let alone a local arc originating from the inner conductor and passing through the detector element, irrespective of the direction of the arc.

For at least the above reasons, Thrash, Saito, and Crawford all fail to teach or suggest the recitations of independent claims 40, 81, 82, 85, 86, 90, 91, 92, and 93. Further, the Office Action does not provide any teaching from other art or reason why these recitations would be within the knowledge of a person of ordinary skill in the art. As such, the combined teachings of the art, as cited by the Office Action, fail to establish a *prima facie* case of obviousness as to the independent claims. Moreover, claims 41 and 43 – 80 are believed allowable at least for reasons described above and for reasons of their dependence from allowable base claims. Applicant, therefore, respectfully requests that the §103 rejections to all the claims be withdrawn.

CONCLUSION

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

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